CLAIMS

I claim:

1. A reloading system for placing an array of pipette tips in an empty pipette holder, the pipette tips each having a lower tapered tip end and an upper mounting sleeve and the pipette holder having a generally flat support surface provided with an array of openings adapted to receive and hold the array of tips in a tip support position, said system comprising:

a transfer tray having an array of apertures arranged to align with the array of openings in the pipette holder, each of the apertures having a peripheral edge portion adapted to hold a pipette tip by its mounting sleeve with the tip end extending downwardly from the underside of the transfer tray; and,

a push plate adapted to overlie the transfer tray and to engage the mounting sleeves of the tips and push the same through the apertures, separated completely from the transfer tray and into the tip support position on the pipette holder.

2. The system as set forth in claim 1 wherein the transfer tray has a flat upper surface, and the apertures are sized to support the pipette tip mounting sleeves at their lower edges.

3. The system as set forth in claim 1 wherein the transfer tray has a main body portion of generally uniform thickness, said apertures are formed in said main body portion, and the peripheral edge portions of the apertures comprise a plurality of flexible lips extending radially inwardly from the edges of the apertures.

4. The system as set forth in claim 3 wherein said flexible lips are substantially thinner than the thickness of said main body portion.

5. The system as set forth in claim 4 wherein the main body portion of said transfer tray has a generally flat underside and said flexible lips are generally coplanar with said flat underside.

6. The system as set forth in claim 3 comprising three flexible lips for each aperture, said lips positioned equally spaced around the aperture.

7. The system as set forth in claim 1 including a support structure depending downwardly from the underside of the transfer tray and engageable with the flat support surface of the pipette holder to hold the tips above the support position with the tip ends extending into the pipette holder openings.

8. The system as set forth in claim 6 wherein the radially inner edges of the lips comprise circular arcs defining a diameter approximately equal to the diameter of the openings in the pipette holder.

9. The system as set forth in claim 8 wherein said support structure comprises a plurality of legs extending generally perpendicular to the transfer tray and positioned between adjacent apertures.

10. The system as set forth in claim 1 wherein the push plate comprises an upper body having a generally planar undersurface and an array of fingers extending downwardly from the undersurface arranged to align with and extend into the mounting sleeves of the tips

11. The system as set forth in claim 10 wherein each of said fingers comprises a tapered distal end sized to extend into the mounting sleeve of a tip, and a generally cylindrical proximal end sized to pass through a transfer tray aperture and forming at the juncture with the distal end a shoulder adapted to engage the upper edge of the pipette tip mounting sleeve.

12. A method of reloading a pipette tip holder of the type having a generally flat support surface provided with an array of openings adapted to receive and hold an array of tips in a tip support position with the ends pointing downwardly, said method comprising the steps of:

(1) supporting the array of tips in an array of apertures on a transfer device, said apertures arranged to align with the array of openings in the pipette tip holder;

(2) positioning the transfer device and the array of tips supported thereon over the holder with the tip ends extending into the openings; and,

(3) pushing the tips downwardly through the transfer device and into the tip support position on the tip holder.

13. The method as set forth in claim 12 wherein the pipette tips are of the type having a tapered tip end and an upper mounting sleeve defining a shoulder with the tip end and wherein said supporting step comprises engaging the shoulders of the mounting sleeves of the tips on the peripheries of the apertures in the transfer device.

14. The method as set forth in claim 12 wherein said transfer device comprises a generally flat upper body containing said apertures and a support structure depending downwardly from the body, and wherein said positioning step comprises engaging the flat support surface of the holder with said support structure.

15. The method as set forth in claim 12 wherein said pushing step comprises the steps of:

(1) placing a push plate on top of the tip mounting sleeves in the transfer device; and,

(2) pushing the push plate downwardly to simultaneously push all the tips through the transfer device.

16. The method as set forth in claim 15 wherein the step of placing the push plate on top of the tip mounting sleeves in the transfer device is preformed prior to said positioning step.

17. A method for reloading an empty pipette tip holder with an array of pipette tips, the pipette tips each having a lower tapered tip end and an upper mounting sleeve and the pipette tip holder having a generally flat support surface provided with an array of openings adapted to receive and loosely hold the array of tips in a tip support position, said method comprising the steps of:

(1) providing a transfer tray having a generally flat body with an array of apertures arranged to align with the array of openings in the holder;

(2) forming each of the apertures with a flexible peripheral edge portion sized to hold a pipette tip by its mounting sleeve with the tip end extending downwardly from the underside of the transfer tray body;

(3) engaging the mounting sleeves of the tips with a push plate having a plurality of downwardly depending protrusions corresponding to and alignable with the pipette tips in the transfer tray; and,

(4) pushing the tips with the push plate through the apertures, past the edge portions and free of the transfer tray into the tip support position on the pipette holder.

18. The method as set forth in claim 17 comprising, prior to the pushing step, the step of holding the pipette tips above the support position with a support structure depending downwardly from the underside of the transfer tray and in engagement with the flat support surface of the pipette holder.

19. The method as set forth in claim 18 wherein the holding step comprises supporting the pipette tips in the transfer tray with the tip ends extending downwardly past the support structure.